

Si-O-C Aerogels for TPS of Reentry Vehicles, Phase II

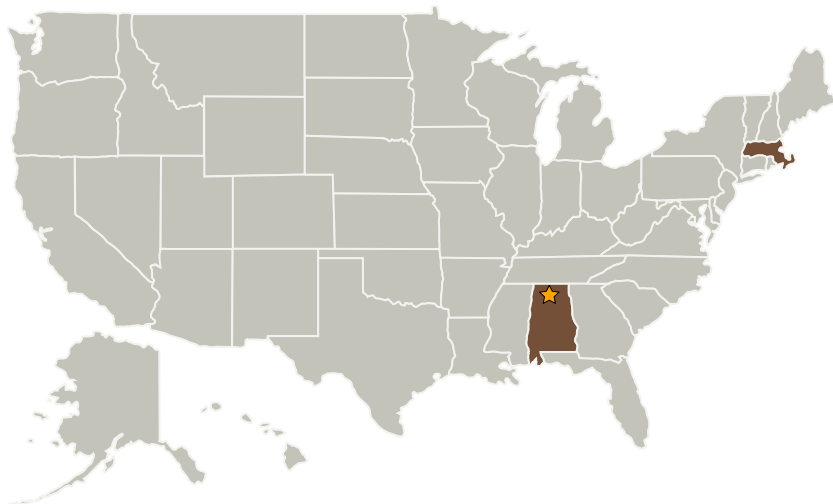
Completed Technology Project (2005 - 2007)



Project Introduction

NASA has expressed a need to identify and develop breakthrough technologies that have potential to provide increased scientific return at lower cost, and to enable missions and capabilities beyond current horizons. To make these missions feasible, advanced thermal materials are needed as thermal protection system (TPS) materials for reentry. For this Phase II SBIR project, Aspen Aerogels Inc. proposes to develop particularly innovative, lightweight silicon oxycarbide aerogels ($\text{SiC}_x\text{O}_{2-2x}$) that will advance the state-of-the-art for thermal protection systems (TPS) for reentry vehicles. Aerogels are lightweight materials with exceptional insulating capabilities. Because of their low thermal conductivities and lightweight, the inclusion of aerogel based insulation materials in TPS will result in significant weight savings over the current baseline construction. During the proposed effort we will optimize the aerogel composites developed during the Phase I effort for use as high temperature insulation for reusable launch vehicles. The Phase II program will focus on complete characterization and testing so that aerogels can be qualified for use as insulation materials on reentry vehicles. The mechanical, and thermal properties of the silicon oxycarbide aerogels will be fully characterized, and a low-cost, environmentally benign manufacturing process will be used.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Aspen Aerogels, Inc.	Supporting Organization	Industry	Northborough, Massachusetts

Primary U.S. Work Locations	
Alabama	Massachusetts

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.3 Thermal Protection Components and Systems
 - └ TX14.3.1 Thermal Protection Materials